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HICKMAN PALERMO TRUONG & BECKER, LLP
2055 GATEWAY PLACE
SUITE 550
SAN JOSE, CA 95110

EXAMINER	
CHEN, SHIN HON	

ART UNIT	PAPER NUMBER
2431	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/820,980	KHARE ET AL.	
	Examiner	Art Unit	
	SHIN-HON CHEN	2431	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-36 have been examined.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/31/08 has been entered.

Claim Objections

3. Claim 18 is objected to because of the following informalities: Claim 18 discloses a nonvolatile or volatile computer-readable medium, which includes carrier wave as disclosed in the specification (Specification: [0059]). Applicant is advised to amend the claim to " a computer-readable **storage** medium". Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Talpade et al. U.S. Pub. No. 20040148520 (hereinafter Talpade) in view of Fan et al. U.S. Pat. No. 6219706 (hereinafter Fan).

6. As per claim 1, Talpade discloses a method of preventing an attack on a network, the method comprising the computer-implemented steps of:

receiving an ICMP packet, wherein the ICMP packet carries a portion of a header associated with a connection in a connection-oriented transport protocol (Talpade: [0020] lines 4-5 and lines 13-15: analyze packet header for packet filtering for ICMP packet based on range of valid values of various packet header fields);

and responding to the ICMP packet by updating a parameter associated with the transport protocol connection only if the packet filed value is determined to be valid (Talpade: [0017] lines 27-30: forwarding traffic/updating parameter associated with protocol connection if packet is not DDoS packet/the packet value is valid).

Talpade does not explicitly disclose wherein the portion of the header carries a packet sequence value associated with the connection; obtaining a packet sequence value from the header; determining if the packet sequence value is valid; and responding to the ICMP packet by updating a parameter value associated with the transport protocol connection only if the packet sequence value is determined to be valid.

However, Fan discloses filtering packets based on the sequence number presented in the header portion of a packet and update the current session state if sequence value is valid (Fan: column 10 lines 27-51: using packet values to filter DoS packets). It would have been obvious to

one having ordinary skill in the art to utilize the sequence number contained in the connection-oriented packet into the field value of the ICMP packet because they are analogous art used to control DoS attack. Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant's invention to combine the teachings of Fan within the system of Talpade because it allows packet filter to analyze invalid range of value presented in header for filtering purposes.

7. As per claim 2, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the ICMP carries a portion of a TCP header associated with a TCP connection (Fan: column 10 lines 27-51). Same rationale applies here as above in rejecting claim 1.

8. As per claim 3, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP "endpoint unreachable" error packet (Talpade: [0006]: error packets in denial of service attack).

9. As per claim 4, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP packet that specifies that fragmentation is needed (Talpad: [0020] lines 4-6: ICMP messages).

10. As per claim 5, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of packet sequence values that are allowed by the transport protocol for the connection (Fan: column 10 lines 27-51).

11. As per claim 6, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of sent but unacknowledged TCP packet sequence values for the connection (Fan: column 10 lines 27-51).

12. As per claim 7, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is exactly equal to one or more sequence values of one or more packets that are then-currently stored in a TCP re-transmission buffer, starting at a sequence value of a previously sent segment that resulted in receiving the ICMP packet (Fan: column 10 lines 35-41).

13. As per claim 8, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the steps are performed in a router acting as a TCP endpoint node (Talpade: [0020]: sensor/firewall).

14. As per claim 9, Talpade as modified discloses the method of claim 1. Talpade as modified further discloses wherein the steps are performed in a firewall device (Talpade: [0020]: packet filtering device/firewall; Fan: column 10 lines 27-51: firewall/packet filter).

15. As per claim 10, Talpade discloses a method of preventing an attack on a network, the method comprising the computer-implemented steps of:

receiving, at a TCP endpoint node in a TCP/IP packet-switched network (Talpad: [0020] line 1-5: monitor all traffic entering customer network that includes TCP/IP protocol), an ICMP packet, wherein the ICMP packet carries a portion of a header associated with a connection in a connection-oriented transport protocol (Talpade: [0020] lines 4-5 and lines 13-15: analyze packet header for packet filtering for ICMP packet based on range of valid values of various packet header fields);

and responding to the ICMP packet by updating a parameter associated with the transport protocol connection only if the packet filed value is determined to be valid (Talpad: [0017] lines 27-30: forwarding traffic/updating parameter associated with protocol connection if packet is not DDoS packet/the packet value is valid).

Talpade does not explicitly disclose wherein the portion of the header includes a packet sequence value associated with the connection; obtaining a packet sequence value from the header; determining if the packet sequence value is valid; and responding to the ICMP packet by updating a parameter value associated with the transport protocol connection only if the packet sequence value is determined to be valid.

However, Fan discloses filtering packets based on the sequence number presented in the header portion of a packet and update the current session state if sequence value is valid (Fan: column 10 lines 27-51: using packet values to filter DDoS packets). It would have been obvious to one having ordinary skill in the art to utilize the sequence number contained in the connection-oriented packet into the field value of the ICMP packet because they are analogous art used to control DoS attack. Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant's invention to combine the teachings of Fan within the system of Talpade because it allows packet filter to analyze invalid range of value presented in header for filtering purposes.

Talpade as modified does not explicitly disclose updating MTU value associated with the TCP connection. However, Talpade discloses forwarding traffic if the packet value is valid (Talpad: [0017] lines 27-30) and it would have obvious to one having ordinary skill in the art to take different measures to allow traffic including, but not limited to, updating MTU value to increase transmission rate to allow traffic.

16. As per claim 11, Talpade as modified discloses the method of claim 10. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP "endpoint unreachable" error packet (Talpade: [0006]: error packets in denial of service attack).

17. As per claim 12, Talpade as modified discloses the method of claim 10. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an

ICMP packet that specifies that fragmentation is needed (Talpad: [0020] lines 4-6: ICMP messages).

18. As per claim 13, Talpade as modified discloses the method of claim 10. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of packet sequence values that are allowed by the transport protocol for the connection (Fan: column 10 lines 27-51).

19. As per claim 14, Talpade as modified discloses the method of claim 10. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of sent but unacknowledged TCP packet sequence values for the connection (Fan: column 10 lines 27-51).

20. As per claim 15, Talpade as modified discloses the method of claim 10. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is exactly equal to one or more sequence values of one or more packets that are then-currently stored in a TCP re-transmission buffer, starting at a sequence value of a previously sent segment that resulted in receiving the ICMP packet (Fan: column 10 lines 35-41).

21. As per claim 16, Talpade as modified discloses the method of claim 10. Talpade as modified further discloses wherein the steps are performed in a router acting as a TCP endpoint node (Talpade: [0020]: sensor/firewall).

22. As per claim 17, Talpade as modified discloses the method of claim 10. Talpade as modified further discloses wherein the steps are performed in a firewall device (Talpade: [0020]: packet filtering device/firewall; Fan: column 10 lines 27-51: firewall/packet filter).

23. As per claim 18, Talpade discloses a volatile or nonvolatile computer-readable medium carrying one or more sequences of instruction, which instructions, when executed by one or more processors, cause the one or more processors to perform the steps of:

receiving an ICMP packet, wherein the ICMP packet carries a portion of a header associated with a connection in a connection-oriented transport protocol (Talpade: [0020] lines 4-5 and lines 13-15: analyze packet header for packet filtering for ICMP packet based on range of valid values of various packet header fields);

and responding to the ICMP packet by updating a parameter associated with the transport protocol connection only if the packet filed value is determined to be valid (Talpad: [0017] lines 27-30: forwarding traffic/updating parameter associated with protocol connection if packet is not DDoS packet/the packet value is valid).

Talpade does not explicitly disclose wherein the portion of the header includes a packet sequence value associated with the connection; obtaining a packet sequence value from the header; determining if the packet sequence value is valid; and responding to the ICMP packet by

updating a parameter value associated with the transport protocol connection only if the packet sequence value is determined to be valid.

However, Fan discloses filtering packets based on the sequence number presented in the header portion of a packet and update the current session state if sequence value is valid (Fan: column 10 lines 27-51: using packet values to filter DDoS packets). It would have been obvious to one having ordinary skill in the art to utilize the sequence number contained in the connection-oriented packet into the field value of the ICMP packet because they are analogous art used to control DoS attack. Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant's invention to combine the teachings of Fan within the system of Talpade because it allows packet filter to analyze invalid range of value presented in header for filtering purposes.

24. As per claim 19, Talpade discloses an apparatus for preventing an attack on a network, comprising:

means for receiving an ICMP packet, wherein the ICMP packet carries a portion of a header associated with a connection in a connection-oriented transport protocol (Talpade: [0020] lines 4-5 and lines 13-15: analyze packet header for packet filtering for ICMP packet based on range of valid values of various packet header fields);

and means for responding to the ICMP packet by updating a parameter associated with the transport protocol connection only if the packet filed value is determined to be valid (Talpad: [0017] lines 27-30: forwarding traffic/updating parameter associated with protocol connection if packet is not DDoS packet/the packet value is valid).

Talpade does not explicitly disclose wherein the portion of the header carries a packet sequence value associated with the connection; means for obtaining a packet sequence value from the header; means for determining if the packet sequence value is valid; and responding to the ICMP packet by updating a parameter value associated with the transport protocol connection only if the packet sequence value is determined to be valid.

However, Fan discloses filtering packets based on the sequence number presented in the header portion of a packet and update the current session state if sequence value is valid (Fan: column 10 lines 27-51: using packet values to filter DDoS packets). It would have been obvious to one having ordinary skill in the art to utilize the sequence number contained in the connection-oriented packet into the field value of the ICMP packet because they are analogous art used to control DoS attack. Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant's invention to combine the teachings of Fan within the system of Talpade because it allows packet filter to analyze invalid range of value presented in header for filtering purposes.

25. As per claim 20, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP packet that includes a copy of a TCP header associated with a TCP connection (Fan: column 10 lines 27-51). Same rationale applies here as above in rejecting claim 1.

26. As per claim 21, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an

ICMP "endpoint unreachable" error packet (Talpade: [0006]: error packets in denial of service attack).

27. As per claim 22, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP packet that specifies that fragmentation is needed (Talpad: [0020] lines 4-6: ICMP messages).

28. As per claim 23, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of packet sequence values that are allowed by the transport protocol for the connection (Fan: column 10 lines 27-51).

29. As per claim 24, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of sent but unacknowledged TCP packet sequence values for the connection (Fan: column 10 lines 27-51).

30. As per claim 25, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if

the packet sequence value is valid comprises determining if the packet sequence value is exactly equal to one or more sequence values of one or more packets that are then-currently stored in a TCP re-transmission buffer, starting at a sequence value of a previously sent segment that resulted in receiving the ICMP packet (Fan: column 10 lines 35-41).

31. As per claim 26, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the steps are performed in a router acting as a TCP endpoint node (Talpade: [0020]: sensor/firewall).

32. As per claim 27, Talpade as modified discloses the apparatus of claim 19. Talpade as modified further discloses wherein the steps are performed in a firewall device (Talpade: [0020]: packet filtering device/firewall; Fan: column 10 lines 27-51: firewall/packet filter).

33. As per claim 28, Talpade discloses a network element, comprising:

a network interface that is coupled to a data network for receiving one or more packet flows therefrom (Talpade: figure 2: filter router 230);

a processor (Talpade: figure 2: filter router 230 contains processor);

on or more stored sequence s of instruction which, when executed by the processor, cause the processor to perform the steps of:

receiving an ICMP packet, wherein the ICMP packet carries a portion of a header associated with a connection in a connection-oriented transport protocol (Talpade: [0020] lines

4-5 and lines 13-15: analyze packet header for packet filtering for ICMP packet based on range of valid values of various packet header fields);

responding to the ICMP packet by updating a parameter associated with the transport protocol connection only if the packet filed value is determined to be valid (Talpad: [0017] lines 27-30: forwarding traffic/updating parameter associated with protocol connection if packet is not DDoS packet/the packet value is valid).

Talpade does not explicitly disclose wherein the portion of the header includes a packet sequence value associated with the connection; means for obtaining a packet sequence value from the header; means for determining if the packet sequence value is valid; and responding to the ICMP packet by updating a parameter value associated with the transport protocol connection only if the packet sequence value is determined to be valid.

However, Fan discloses filtering packets based on the sequence number presented in the header portion of a packet and update the current session state if sequence value is valid (Fan: column 10 lines 27-51: using packet values to filter DDoS packets). It would have been obvious to one having ordinary skill in the art to utilize the sequence number contained in the connection-oriented packet into the field value of the ICMP packet because they are analogous art used to control DoS attack. Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant's invention to combine the teachings of Fan within the system of Talpade because it allows packet filter to analyze invalid range of value presented in header for filtering purposes.

34. As per claim 29, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP packet that includes a copy of a TCP header associated with a TCP connection (Fan: column 10 lines 27-51). Same rationale applies here as above in rejecting claim 1.

35. As per claim 30, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP "endpoint unreachable" error packet (Talpade: [0006]: error packets in denial of service attack).

36. As per claim 31, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the step of receiving an ICMP packet comprises receiving an ICMP packet that specifies that fragmentation is needed (Talpad: [0020] lines 4-6: ICMP messages).

37. As per claim 32, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of packet sequence values that are allowed by the transport protocol for the connection (Fan: column 10 lines 27-51).

38. As per claim 33, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is within a range of sent but unacknowledged TCP packet sequence values for the connection (Fan: column 10 lines 27-51).

39. As per claim 34, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the step of authenticating the ICMP packet by determining if the packet sequence value is valid comprises determining if the packet sequence value is exactly equal to one or more sequence values of one or more packets that are then-currently stored in a TCP re-transmission buffer, starting at a sequence value of a previously sent segment that resulted in receiving the ICMP packet (Fan: column 10 lines 35-41).

40. As per claim 35, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the steps are performed in a router acting as a TCP endpoint node (Talpade: [0020]: sensor/firewall).

41. As per claim 36, Talpade as modified discloses the network element of claim 28. Talpade as modified further discloses wherein the steps are performed in a firewall device (Talpade: [0020]: packet filtering device/firewall; Fan: column 10 lines 27-51: firewall/packet filter).

Response to Arguments

42. Applicant's arguments filed on 6/30/08 have been fully considered but they are not persuasive.

Regarding applicant's remarks, applicant argues that the prior art of record does not explicitly disclose packet sequence value that is carried within the ICMP packet because there is no TCP header after the IP header and before the ICMP packet data. However, the claims disclose the packet carries sequence value without specifying the manner for which the sequence values are carried. Therefore, the examiner has relied on the combination of references to disclose including pertinent information in the packet to filter unauthorized packets.

On the other hand, applicant argues that the prior art of record does not explicitly disclose updating a maximum transmission unit value associated with the TCP connection only if the packet sequence number is determined to be valid. However, the examiner has provided rationale in the above 35 U.S.C. 103 rejection to state that even although the particular method of allowing traffic flow is not specifically disclosed by the prior art of record (Talpade), Talpade discloses forwarding traffic flow when a field value is determined to be valid (Talpade: [0017] lines 28-30) and it would have been obvious to one having ordinary skill in the art to allow traffic flow by updating MTU value because allocating MTU for network traffic is well known in the art. Therefore, applicant's argument is traversed in light of above explanation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shin-Hon Chen whose telephone number is (571) 272-3789. The examiner can normally be reached on Monday through Friday 8:30am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shin-Hon Chen/
Examiner, Art Unit 2431

Shin-Hon Chen
Examiner
Art Unit 2431